

# Bellwork: 1/7/13

Graph the following quadratic function on the grid provided

$$y = -2(x-3)^2 + 8$$

1) Axis of Symmetry:  $x=3$

2) Vertex:  $(3, 8)$

3) Opens? ↓

4) y-intercept: (x=0)  $(0, -10)$

$$-2(0-3)^2 + 8 = -10$$

5) x-intercepts: (y=0)  $(5, 0)$ ,  $(1, 0)$

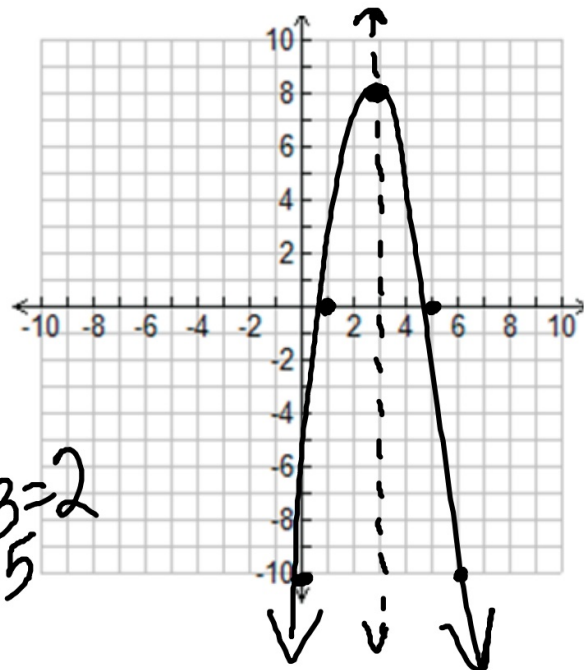
$$-2(x-3)^2 + 8 = 0$$

$$-2(x-3)^2 = -8$$

$$\sqrt{(x-3)^2} \neq \sqrt{x}$$

$$x-3=2$$

$$x=5$$



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$$y = -2|x-3| + 8$$

over 1 up 1

over 2 up 2

over 3 up 3



$$y = -2(x-3)^3 + 8$$

$$y = -2\sqrt{x-3} + 8$$



$$y = -2(x-3)^2 + 8$$

over 1 up 1

over 2 up 4

over 3 up 9



$$y = -2\left(\frac{1}{x-3}\right) + 8$$

$$y = -2 \log(x-3) + 8$$

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## 4.6 - Solving Quadratic Equations using the Quadratic Formula

Some quadratic equations are not factorable. If you are asked to solve a quadratic equation and it is not factorable, you must use the **QUADRATIC FORMULA** to solve.

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**\*\* Equation must be equal to zero to use the quadratic formula. \*\***

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$$1) \quad x^2 - 5x - 7 = 0$$

$$a = 1 \quad b = -5 \quad c = -7$$

$$\frac{5 \pm \sqrt{(-5)^2 - 4(1)(-7)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{53}}{2}$$

$$\left( \frac{5 + \sqrt{53}}{2}, 0 \right)$$

$$\left( \frac{5 - \sqrt{53}}{2}, 0 \right)$$

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$$2) \quad 2x^2 - x - 4 = 0$$

$$a=2 \quad b=-1 \quad c=-4$$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(2)(-4)}}{2(2)}$$

$$\frac{1 \pm \sqrt{33}}{4}$$

$$\frac{1 + \sqrt{33}}{4}$$

$$(1.7, 0)$$

$$\frac{1 - \sqrt{33}}{4}$$

$$(-1.1, 0)$$

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$$3) \quad x^2 + 3x = 13$$

$$\begin{array}{r} -13 \quad -13 \\ \hline x^2 + 3x - 13 = 0 \end{array}$$

$$a=1 \quad b=3 \quad c=-13$$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(1)(-13)}}{2(1)}$$

$$\frac{-3 \pm \sqrt{61}}{2}$$

$$\frac{-3 + \sqrt{61}}{2}$$

$$(2.4, 0)$$

$$\frac{-3 - \sqrt{61}}{2}$$

$$(-5.4, 0)$$

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$$4) 3x^2 = 4x + 3$$

$$\textcircled{5} -x^2 - 7x - 4 = 0$$

**Homework: pg 245 #11-20**

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